Portage County Groundwater Concerns

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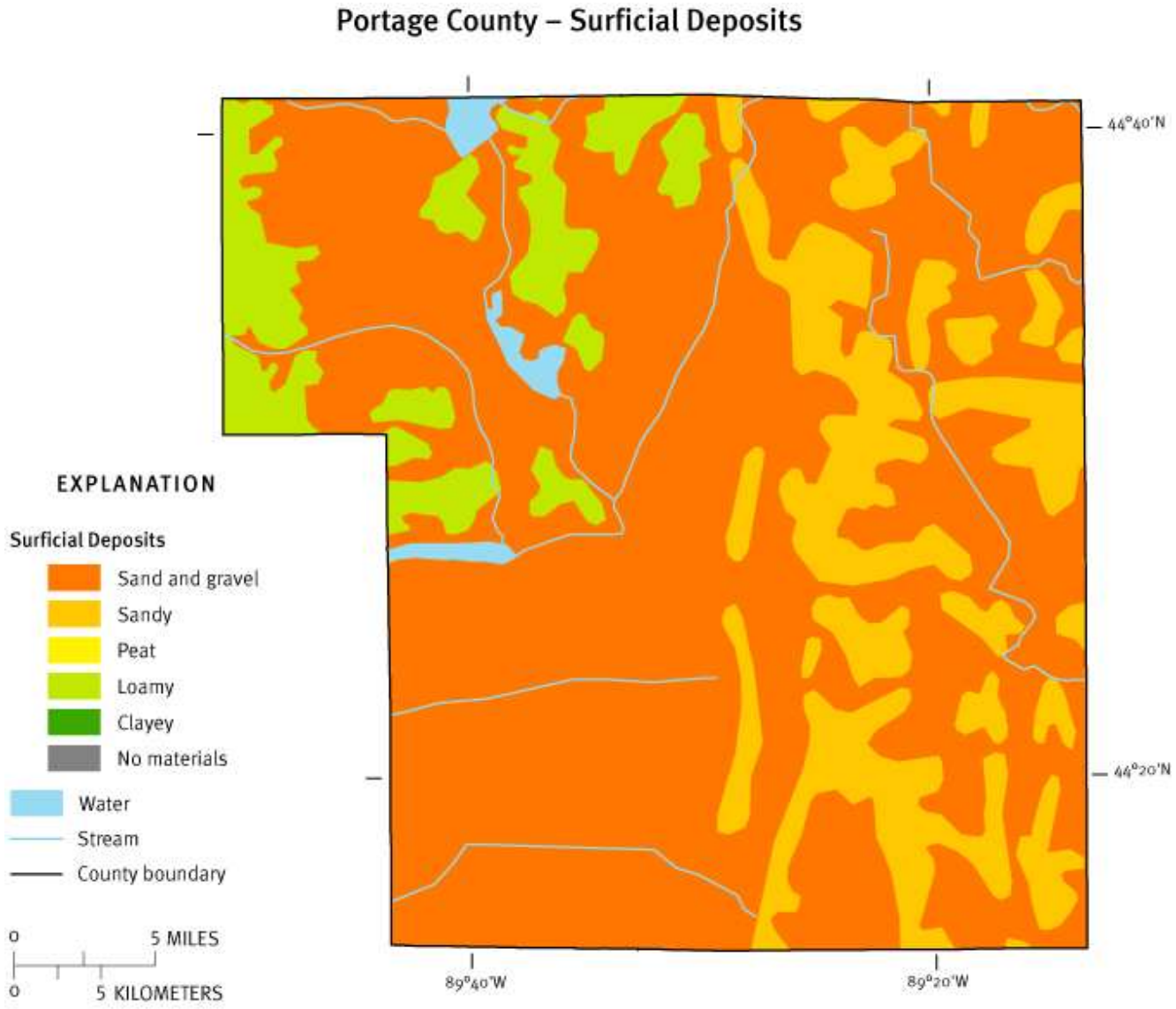
Surficial Deposits in Portage County

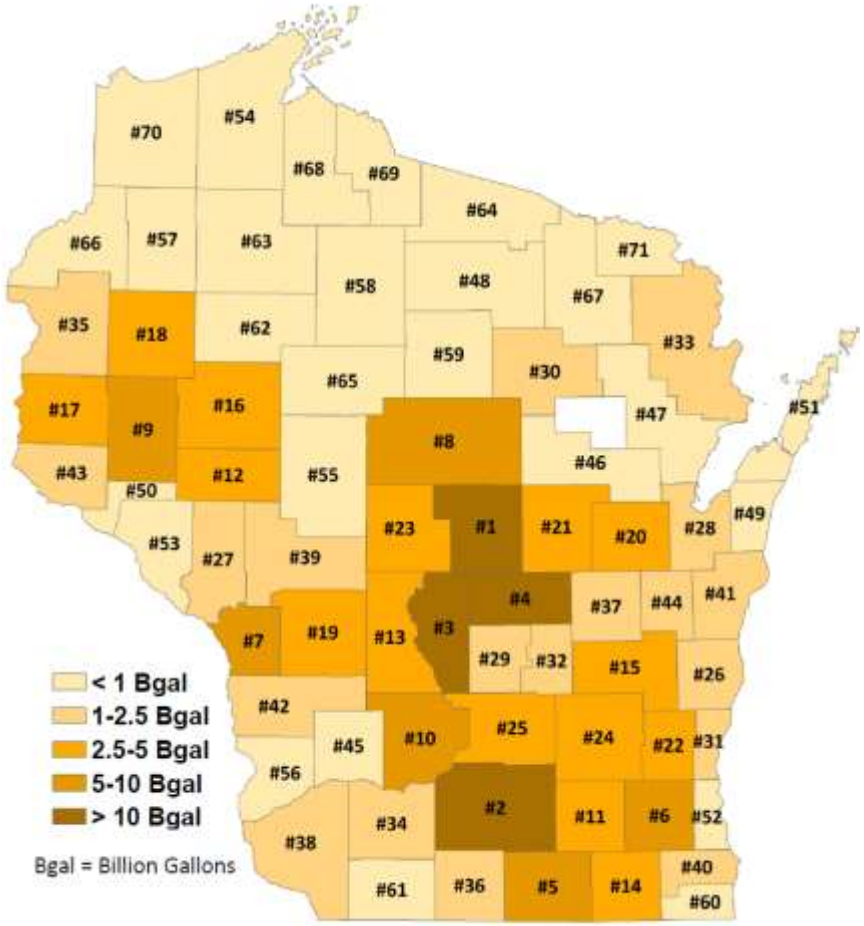


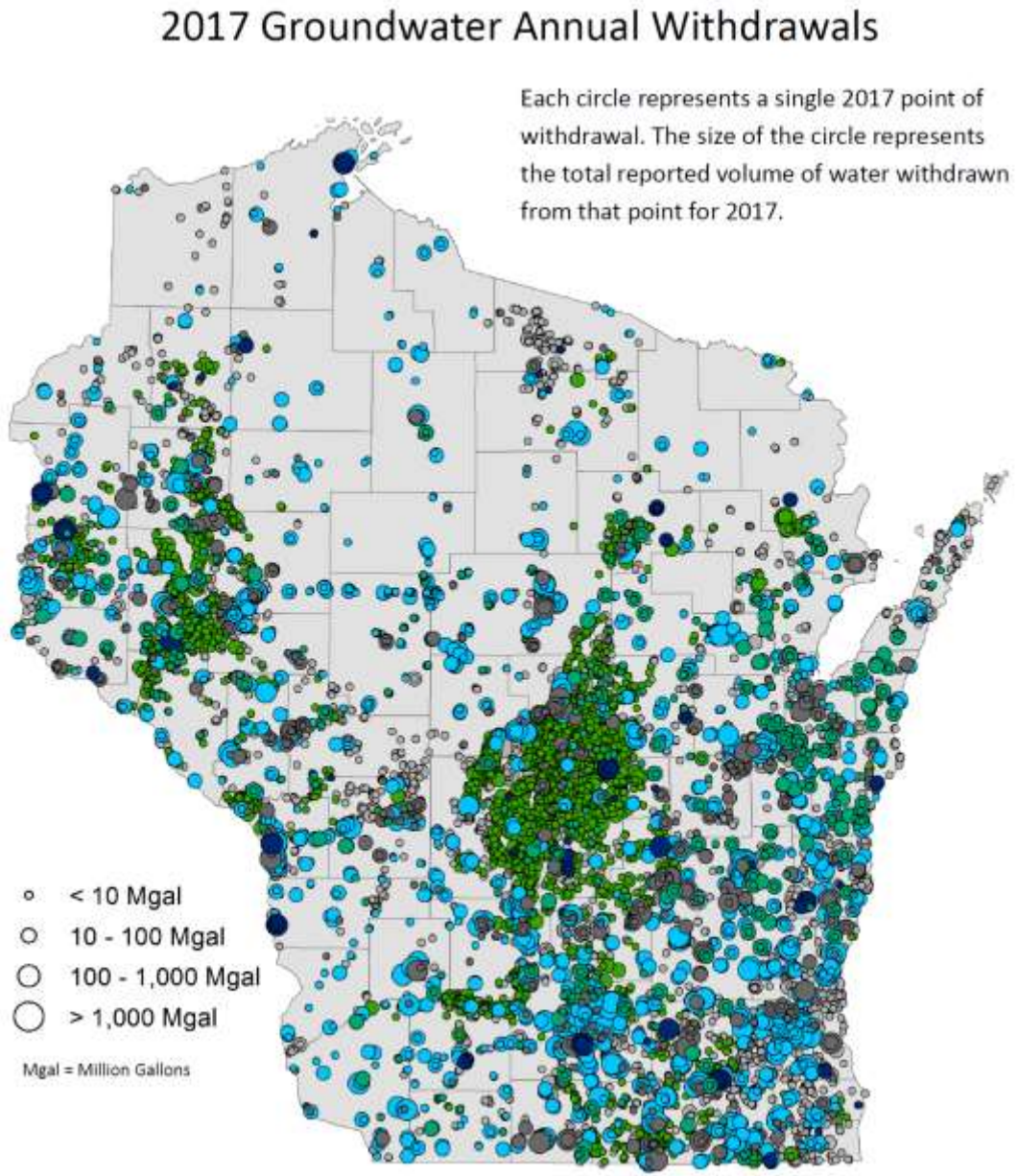
This resource characteristic map was derived from generalized statewide information at small scales, and cannot be used for any site-specific purposes.

Map source: Schmidt, R.R., 1987, Groundwater contamination susceptibility map and evaluation: Wisconsin Department of Natural Resources, Wisconsin's Groundwater Management Plan Report 5, PUBL-WR-177-87, 27 p.

Figure created for the "Protecting Wisconsin's Groundwater Through Comprehensive Planning" web site, 2007, *http://wi.water.usgs.gov/gwcomp/*

Water Quantity





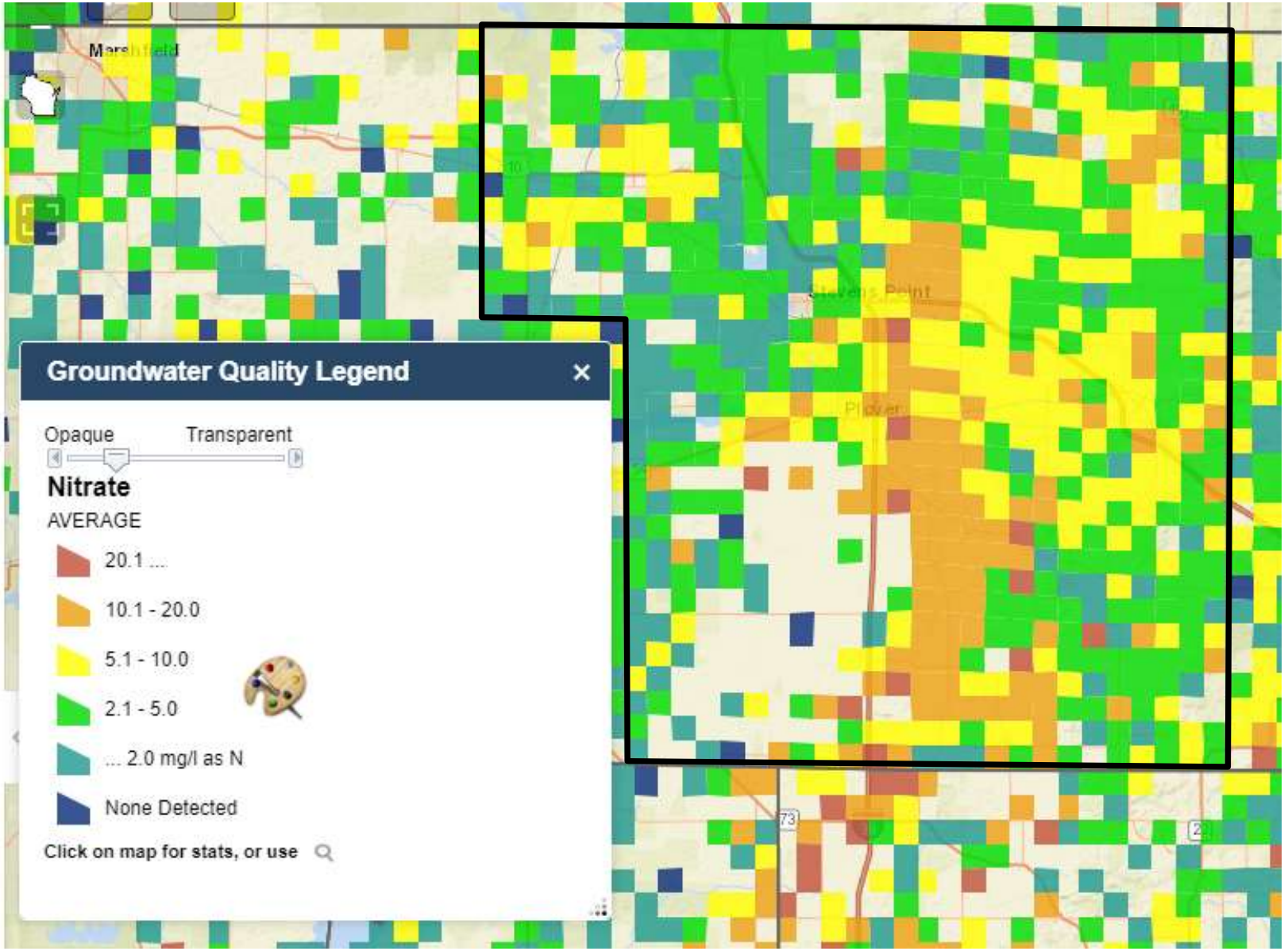
Figures from the 2017 WDNR Water Use Report https://dnr.wi.gov/topic/WaterUse/documents/WithdrawalReportDetail2017.pdf

Water Quality Concerns

- Herbicides and Pesticides
- Neonicotinoids
- Pharmaceuticals and personal care products
- Radon
- **Nitrate-nitrogen**

Wisconsin Well Water Viewer

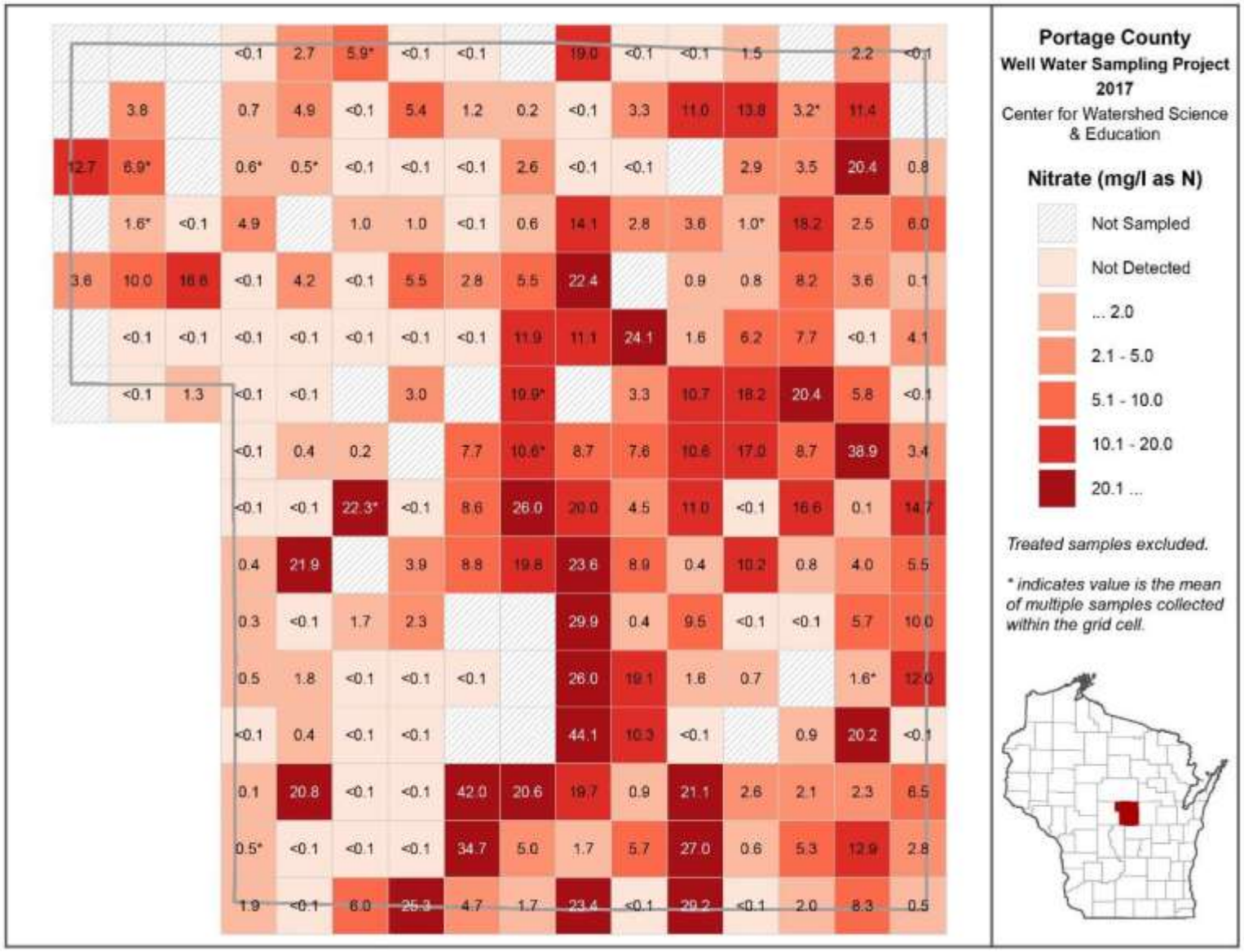
- 20% of Wells exceed the nitrate-nitrogen drinking water standard of 10 mg/L
- Range of values: non-detect to 76 mg/L



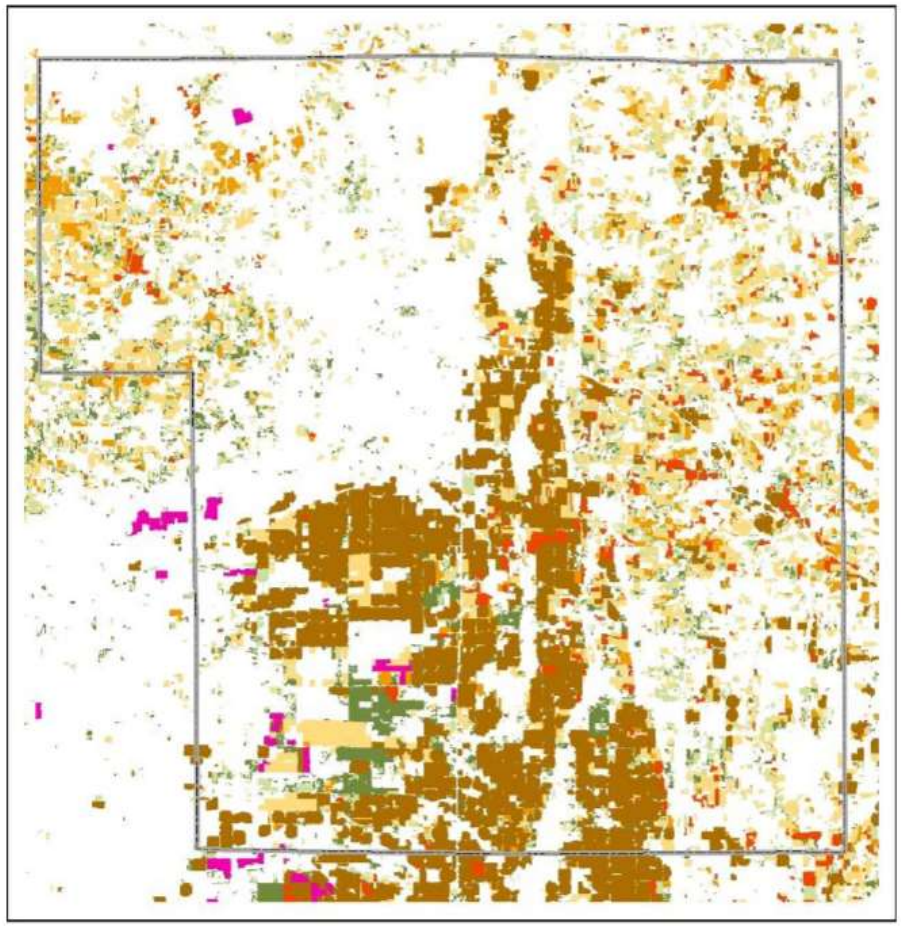
2017 Wisconsin Well Water Viewer
https://gissrv3.uwsp.edu/webapps/gwc/pri_wells/

Portage County Well Water Quality Study

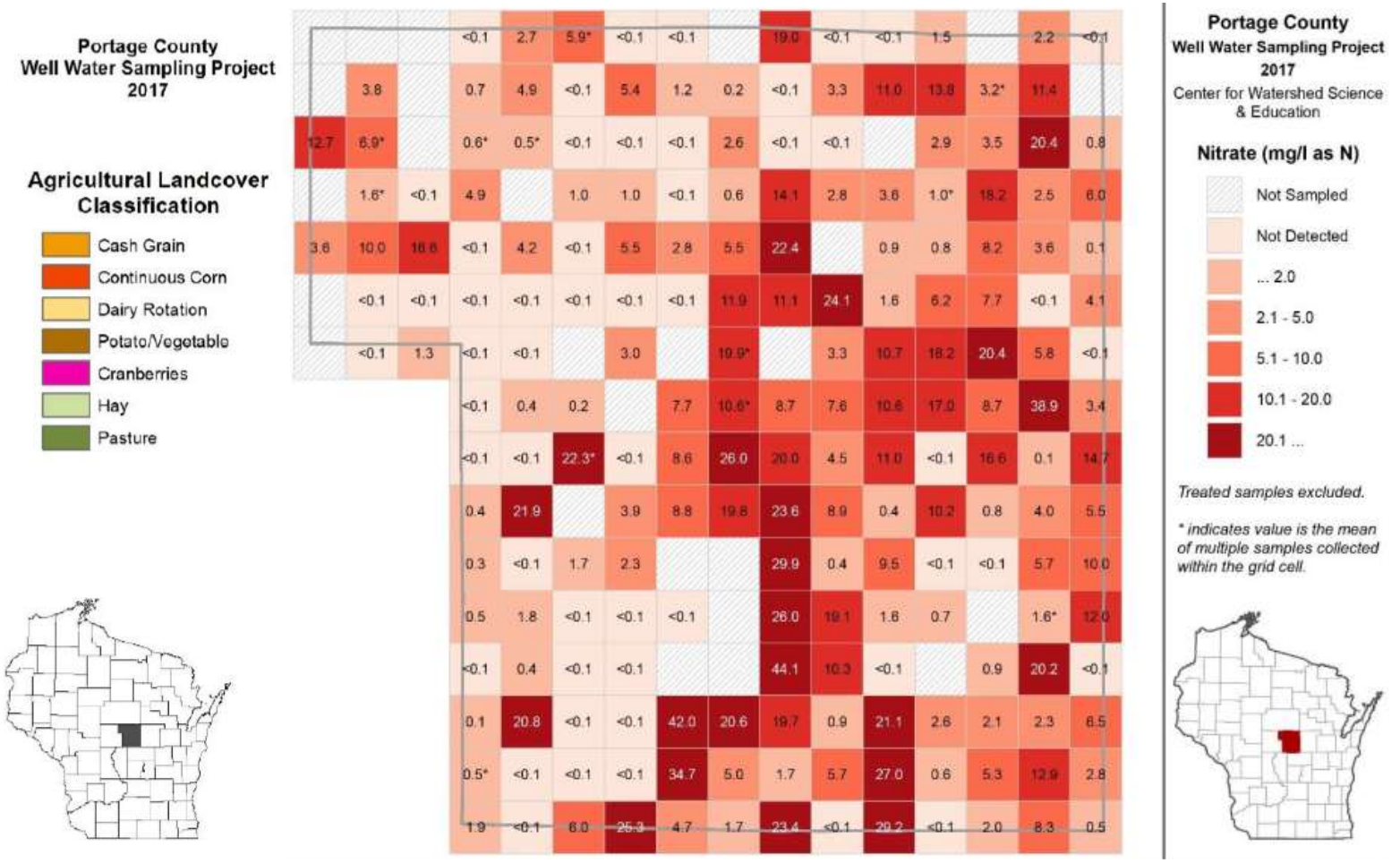
- 24% of Wells exceed the nitrate-nitrogen drinking water standard of 10 mg/L
- Range of values: non-detect to 44 mg/L



https://www.co.portage.wi.us/department/planning-zoning/portage-county-well-water-quality-project



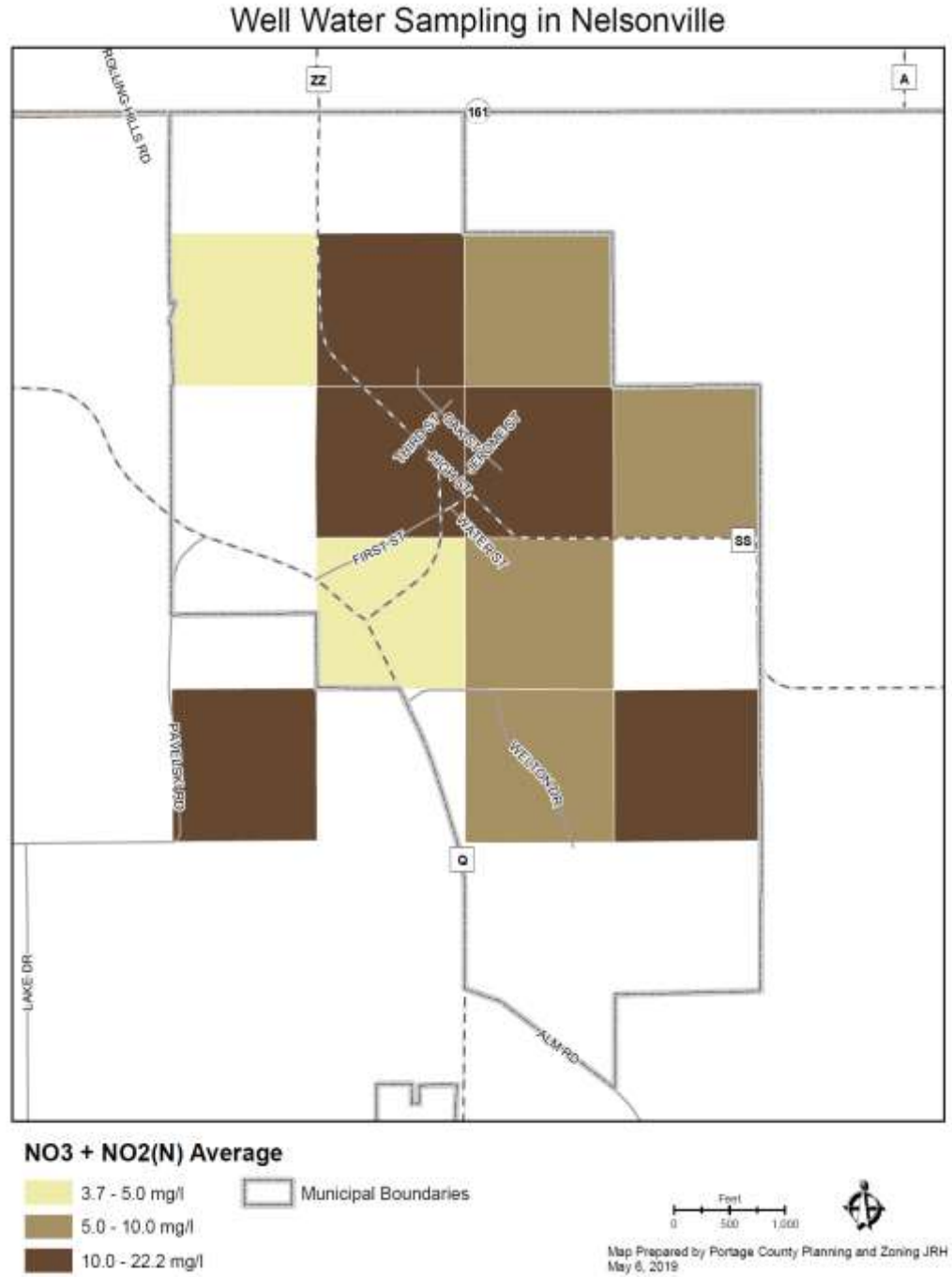
Source: Wiscland 2.0



https://www.co.portage.wi.us/department/planning-zoning/portage-county-well-water-quality-project

Village of Nelsonville Study

- 47% of Wells exceed the nitrate-nitrogen drinking water standard of 10 mg/L
- Range of values: non-detect to 23.7 mg/L



https://www.co.portage.wi.us/department/planning-zoning/nelsonville-well-water-qulaity-project

Pharmaceutical and Personal Care Products

Lab ID#	Acesulfame (artificial sweetener)	Sucralose (artificial sweetener)	Saccharin (artificial sweetener)	Acetaminophen (analgesic)	Cotinine (nicotine metabolite)	Caffeine (stimulant)	Paraxanthine (caffeine metabolite)	Carbamazepine (antiepileptic)	Trimethoprim (human antibiotic)	Sulfamethazine (bovine antibiotic)	Sulfamethoxazole (human antibiotic)	Venlafaxine (antidepressant)	Triclosan (antimicrobial)
	Sample concentration parts per trillion (ng/L)												
1800008-09	**22.1**	**92.1**	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
1800008-10	**14.1**	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
1800008-11	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
1800008-12	**13.3**	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
1800008-13	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
1800008-14	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
1800008-15	**35.3**	**47.8**	<LOD	<LOD	<LOD	<LOD	<LOD	**6.4**	<LOD	<LOD	**5.5**	<LOD	<LOD
1800008-16	**13.5**	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
1800008-17	<LOD	<LOD	<LOD	<LOD	<LOD	**12.1**	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
1800008-18	**263**	**178**	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	**21.2**	<LOD	<LOD
1800008-25	**246**	**923**	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
1800008-26	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Limit of detection	5.0	25.0	25E	35E	3.0	12.0	5.0	2.0	5E	1.0	5E	5E	75.0

https://www.co.portage.wi.us/department/planning-zoning/nelsonville-well-water-qulaity-project

Herbicide Breakdown Products

Lab ID#	Alachlor OA	Alachlor ESA	Metolachlor OA	Metolachlor ESA
	Sample concentration parts per trillion (ng/L			
1800008-01	<LOD	138	90	512
1800008-02	<LOD	<LOD	299	2268A
1800008-04	<LOD	<LOD	<LOD	324
1800008-05	<LOD	<LOD	111	1566
1800008-06	<LOD	458	<LOD	269
1800008-07	<LOD	<LOD	258	2466A
1800008-08	<LOD	208	141	1653A
1800008-09	<LOD	<LOD	113	1111
1800008-10	<LOD	90	110	1430
1800008-11	<LOD	194	293	2344A
1800008-12	<LOD	103	<LOD	970
1800008-13	<LOD	<LOD	873	6730A
1800008-14	<LOD	81	126	1860
1800008-15	<LOD	684	366	<LOD
1800008-16	<LOD	541	<LOD	764
1800008-17	<LOD	162	326	3409A
1800008-18	<LOD	89	87	788
1800008-19	<LOD	112	<LOD	1141
1800008-20	<LOD	93	445	5661A
1800008-21	<LOD	<LOD	115	2084A
1800008-22	<LOD	89	<LOD	529
1800008-23	<LOD	226	<LOD	383
1800008-24	<LOD	216	256	4766A
1800008-25	<LOD	117	280	3651A
1800008-26	<LOD	3494A	<LOD	364
Limit of detection	80 E	80 E	80 E	80 E

https://www.co.portage.wi.us/department/planning-zoning/nelsonville-well-water-qulaity-project

Impacts on Private Drinking Water Wells

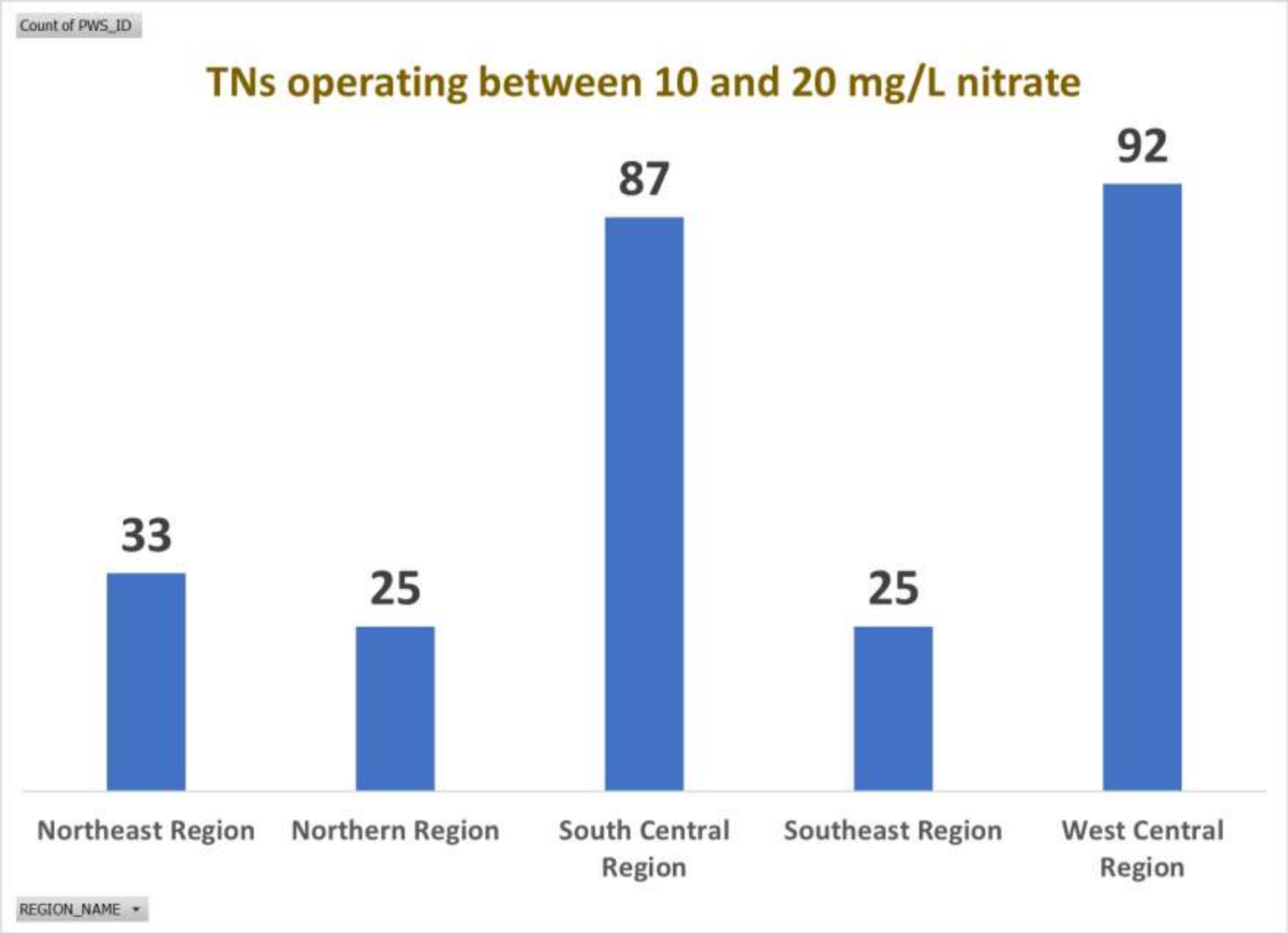
- 15,500 Private Drinking Water Wells in Portage County
- Approximately 20-24% (3,100-3,600) of them over 10 mg/L nitrate-nitrogen,
- 5% (750) over 20 mg/L nitrate-nitrogen
- Minimal cost for treatment is $200
- Well Replacement costs start at $2,000
- In order to provide treatment to the 5% of wells in the County over 10 mg/L it would cost $150,000, new wells would cost $1,500,000

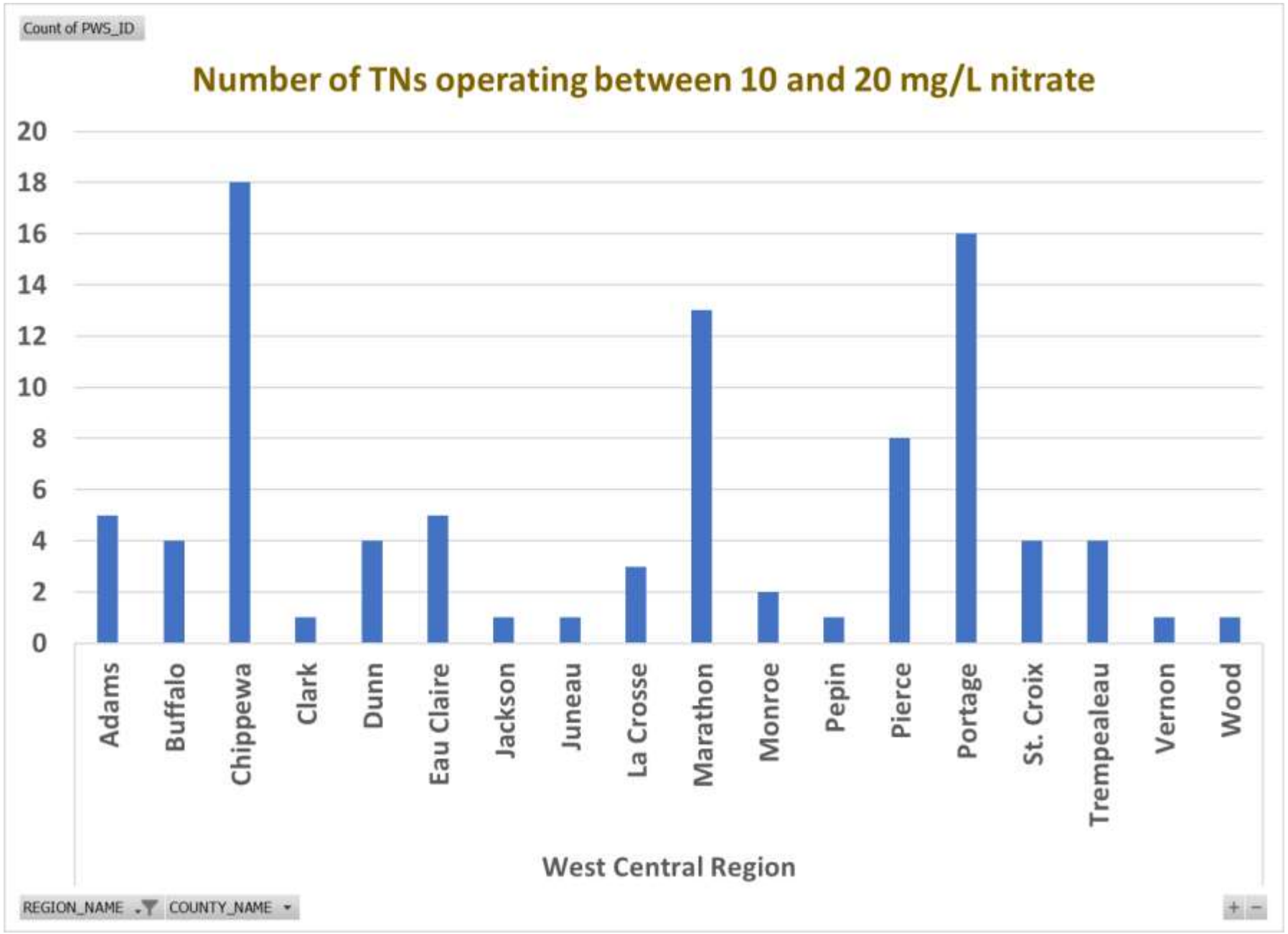
Public Drinking Water Systems

Community water systems *(Serve people where they live)*	**Non-community water systems** *(serve people at work, school, food and entertainment establishments, etc.)*
Municipal community (MC) water systems have 15 or more service connections, or serve a community of at least 25 residents for at least 6 months of the year. MC systems are owned by a city, town, village, or other government entity.	**Non-transient non-community (NN)** water systems serve at least 25 of the same people for at least 6 months of the year. NN systems include schools, day care centers, factories, or businesses with 25 or more employees.
Other-than-municipal community (OTM) water systems have 15 or more service connections, or serve a community of at least 25 residents for at least 6 months of the year, but are not owned by municipalities. OTM systems include mobile home parks, subdivisions, apartment buildings and condominium complexes.	**Transient non-community (TN)** systems serve at least 25 people, but not necessarily the same people, for 60 days a year or more. TN systems include motels, restaurants, taverns, campgrounds, parks and gas stations.

System Type	Total number of systems	Number of systems with a sample ≥ 20 mg/L	Number of systems with a sample ≥ 10 mg/L ≤ 20 mg/L	Number of systems with a sample ≥ 5 mg/L ≤ 10 mg/L	Number of systems with a sample ≤ 5 mg/L
TN	149	11	25	35	78
NN	15	1	4	3	7
OTM	6	1	1	0	4
MC	5	0	4	1	0
Total	175	13	34	39	89
Percentage of total PWS		7.4%	19.4%	22.3%	50.9%

*1/1/2009 to present


Count of PWS_ID
TNs operating between 10 and 20 mg/L nitrate
33
25
87
25
92
Northeast Region
Northern Region
South Central Region
Southeast Region
West Central Region
REGION_NAME


Count of PWS_ID
Number of TNs operating between 10 and 20 mg/L nitrate
20
18
16
14
12
10
8
6
4
2
0
Adams
Buffalo
Chippewa
Clark
Dunn
Eau Claire
Jackson
Juneau
La Crosse
Marathon
Monroe
Pepin
Pierce
Portage
St. Croix
Trempealeau
Vernon
Wood
West Central Region
REGION_NAME
COUNTY_NAME

Systems That Test 10-20 mg/L Nitrate

Continuing Operation

- Provision of NR 809 and the Safe Drinking Water Act
- Applies to Non-Community systems
- “Continue to Operate” with nitrate concentrations above 10 milligrams/liter (mg/L) but not to exceed 20 mg/L
- At department’s “discretion”

Systems That Test 10-20 mg/l Nitrate

NR 809.11(3)

OPERATION WITH NITRATES NOT EXCEEDING 20 MG/L. At the **discretion of the department**, nitrate as nitrogen levels not to exceed 20 mg/l may be allowed in a non-community water system if the water supplier demonstrates all of the following to the satisfaction of the department:

(a) The water will not be available to children under 6 months of age or any female who is or may become pregnant.

(b) The water supplier meets the public notification requirements under s. NR 809.958, including continuous posting of the fact that nitrate as nitrogen levels exceed 10 mg/l and the potential health effects of exposure.

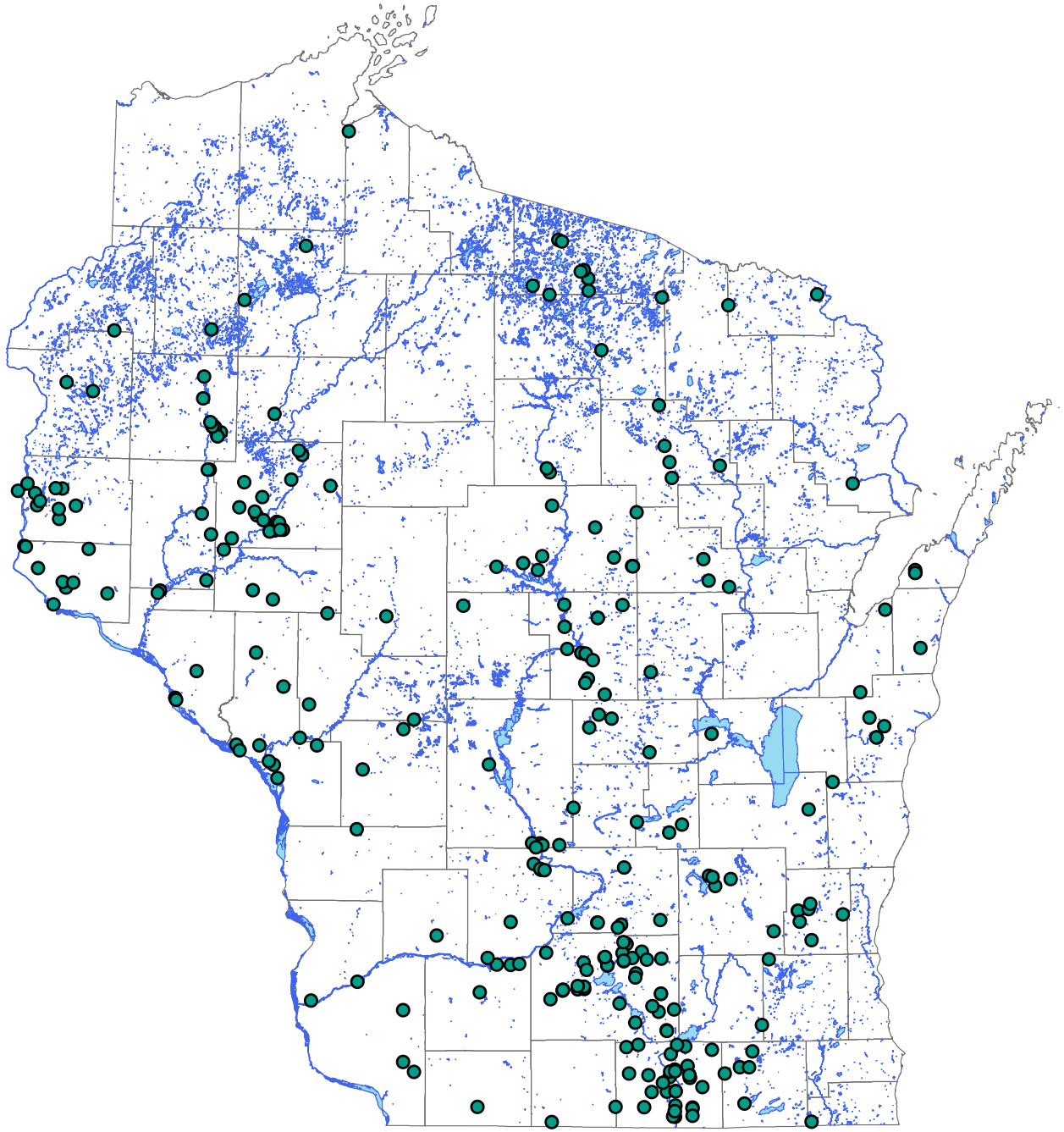
(c) Local and state public health authorities will be notified annually of nitrate as nitrogen levels that exceed 10 mg/l.

(d) A supply of bacteriologically safe drinking water, containing less than 10 mg/l nitrate as nitrogen, is provided for infants less than 6 months of age and any female who is or may become pregnant.

(e) **No adverse health effects will result**.

284 TNs exceed the standard of 10 ppm

Highest number among EPA region 5 states



Other Region 5 States

Ohio	Does not utilize Continuing Operation. Systems required to return to compliance
Indiana	Continuing Operation allowed in restricted situations
Michigan	Provision available to certain businesses. Systems must sign a consent agreement.
Minnesota	Continuing Operation is not an option for restaurants, resorts, campgrounds, and other licensed facilities.

- In 2010, DHS recommends all consumers avoid long-term consumption of water with high nitrate
- In 2013, DHS recommends women who are or may become pregnant not drink water with Nitrate above MCL; all consumers avoid long-term exposure
- No adverse health outcomes is requirement
- TNs unable to meet NR 809.11(3) requirements

Systems That Test Greater Than 20 mg/L Nitrate

Must provide safe drinking water

- Connect to municipal water system
- Drill a new well
- Connect to alternate compliant well
- Install DSPS approved nitrate removal system

Costs To Provide Safe Water

Connect to municipal water	Drill a new well	Point of use nitrate removal system	Point of entry nitrate removal system
*	$2,000-9,000**	$200-800 initially plus maintenance	$5,000-14,000 to buy *** $160-250 per month to rent

*Municipal water isn't an option for many locations

**Drilling a new well: NO guarantee to find low nitrate water

***Treatment system cost is based on water consumption and if a water softener is needed. Treatment systems also require long term maintenance.

Municipal Systems and Nitrate

Municipal Systems and Nitrate	Cost	Mitigation method
AMHERST WATERWORKS	$477,834	New Well
JUNCTION CITY WATERWORKS	Not Available	Decommissioned a well
PLOVER WATERWORKS	$4,000,000	2 Treatment Plants
STEVENS POINT WATERWORKS	Not Available	Decommissioned 2 wells
WHITING WATERWORKS	$669,999	Treatment

What Are We Doing

- County-wide testing program in 2017, will be repeated in 5 years
- Smaller testing programs as funds become available
- Free Nitrate Screening Events
- Farmer-Led Watershed Groups
- Worked with over 100 farmers to encourage lower application rates of nitrogen

Addressing This Problem

Address the needs of those currently struggling with water contamination issues

- Removing limitations on the Well Compensation Grant Fund
- Assistance for those public drinking water sources dealing with elevated nitrate contamination

Address the source of the problem

- Fund those that are on the ground assisting farmers
- Develop a nitrogen application rate that protects groundwater

“Maintain and Improve groundwater quality and quantity in Portage County to support the daily living needs of all Portage County residents, a thriving commercial, agricultural, and industrial economy, the quality of life in rural communities, recreational opportunities, tourism, and the health of groundwater dependent surface waters and their ecosystems”

- Portage County Groundwater Management Plan